11-5830-221-12

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR'S AND ORGANIZATIONAL MAINTENANCE MANUAL INTERCOMMUNICATION STATIONS LS-147A/FI, LS-147B/FI, LS-147C/FI, AND LS-147D/FI

Headquarters, Department of the Army, Washington 25, D.C.

5 June 1961

WARNING

HIGH VOLTAGE
is used in the operation
of this equipment.

DEATH ON CONTACT
may result if operating
personnel fail to observe
safety precautions.

DON'T TAKE CHANCES!
Be careful when working on the 115-volt ac line connections. Turn off the power and disconnect the line cord plug from the ac source before making any connections or before working inside the cabinet. Before connecting the LS-147(*)/FI to a 115-volt ac source, be sure that the chassis is connected to the same ground as the ac source.

This reprint includes all changes in effect at the time of publication - Changes 1 through 3.

*This manual supersedes TM 11-5830-221-12, 7 December 1959.

D 101.11:

READEX FICHE best copy available

TECHNICAL MANUAL

Operator's and Organizational Maintenance Manual

INTERCOMMUNICATION STATIONS LS–147A/FI, LS–147B/FI, LS–147C/FI, AND LS–147D/FI

TM 11–5830–221–12
CHANGES No. 1

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D.C., *5 June 1963*

TM 11–5830–221–12, 5 June 1961, is changed as follows:

Page 5. After paragraph 1 add paragraph 1.1.

1.1. Index of Publications

Refer to the latest issue of DA Pam 310–4 to determine whether there are any new editions, changes, or additional publications pertaining to your equipment. DA Pam 310–4 is an index of current technical manuals, technical bulletins, supply bulletins, lubrication orders, and modification work orders that are available through publication supply channels. The index lists the individual parts (–10, –20, –35P, etc.) and the latest changes to and revisions of each equipment publication.

Delete paragraph 2 and substitute:

2. Forms and Records

a. Reports of Maintenance and Unsatisfactory Equipment. Use equipment forms and records in accordance with the instructions in TM 38–750.

b. Report of Damaged or Improper Shipment. Fill out and forward DD Form 6 (Report of Damaged or Improper Shipment) as prescribed in AR 700–58 (Army), NAVSANDA Publications 378 (Navy), and AFR 71–4 (Air Force).

c. Comments on Manual. Forward all comments on this publication direct to: Commanding Officer, U.S. Army Electronics Materiel Support Agency, ATTN: SELMS–MP, Fort Monmouth, N.J. (DA Form 1598 (Record of Comments on Publications), DA Form 2496 (Disposition Form), or letter may be used.)

Page 11. Delete paragraphs 13 and 14 and substitute:

13. Scope of Operator's Maintenance

The maintenance duties assigned to the operator of the LS–147(*)/FI are listed below together with a reference to the paragraph covering the specific maintenance function. The duties assigned require no special tools or test equipment.

a. Daily preventive maintenance checks and services (par. 14.2).

b. Weekly preventive maintenance checks and services (par. 14.3).

c. Visual inspection (par. 15).

d. Equipment performance checklist (par. 16).

e. Replacing fuses (par. 17).

14. Operator's Preventive Maintenance

Preventive maintenance is the systematic care, servicing, and inspection of the equipment to prevent the occurrence of trouble, to reduce downtime, and to assure that the equipment is serviceable.

a. Systematic Care. The procedures given in paragraphs 14.1 through 17 cover routine systematic care and cleaning essential to proper upkeep and operation of the LS–147(*)/FI.

b. Preventive Maintenance Checks and Services. The preventive maintenance checks and services charts (pars. 14.2 and 14.3) outline functions to be performed at specific intervals. These checks and services are to maintain Army electronic equipment in a combat serviceable condition; that is in good general (physical) condition and in good operating condition. To assist operator's in maintaining combat serviceability, the charts indicate what to check, how to check, and what the normal conditions are; the *References* column lists the illustrations, paragraphs, or manuals that contain supplementary information. If the defect cannot be remedied by the operator, higher echelon maintenance or repair is required. Records and reports of these checks and services must be made in accordance with the requirements set forth in TM 38–750.

Add paragraphs 14.1, 14.2, and 14.3 after paragraph 14:

14.1. Preventive Maintenance Checks and Services Periods

Preventive maintenance checks and services of the LS–147(*)/FI are required on a daily and weekly basis.

a. Paragraph 14.2 specifies checks and services that must be accomplished daily and under the special conditions listed below if the LS–147(*)/FI is used in transportable, mobile, or fixed installations.

(1) When the equipment is initially installed.

(2) When the equipment is reinstalled after removal for any reason.

(3) At least once each week if the equipment is maintained in a standby condition.

b. Paragraph 14.3 specifies *additional* checks and services that must be performed *once* each week.

14.2. Daily Preventive Maintenance Checks and Services Chart

Sequence No.	Item	Procedure	References
1	LS–147(*)/FI	Inspect the exterior of the LS–147(*)/FI for completeness. Requisition missing items.	App. III and figs. 1, 2, 3, 7, 8, and 9.
2	Cabinet exterior and front panel.	***Warning:*** **Cleaning Compound is flammable and its fumes are toxic. Do not use near flame and provide adequate ventilation.** Dampen (not wet) a cloth with cleaning compound and clean front panels and cases; dry front panels and cases with a lint-free cloth.	Figs. 1, 2, and 3.
3	Knobs and switches	While making operating checks (item 4 below), observe that the mechanical action of each knob is smooth and free of external and internal binding.	Figs. 1, 2, and 3.
4	Operation	Perform operating checks as indicated in equipment performance checklist.	Par. 16.

14.3. Weekly Preventive Maintenance Checks and Services Chart

Sequence No.	Item	Procedure	References
1	Cabinet exterior	Tighten loose screws, bolts, and mountings.	Figs. 1, 2, and 3.
2	Exposed metal surfaces	Inspect for rust and corrosion.	Figs. 1, 2, and 3.
3	Signal wire lines	Check to see that the signal wire lines are firmly connected to the binding posts at rear of cabinet.	Figs. 1, 2, and 3.
4	Power cord, plug, and ground connections.	Inspect power cord and plug for cracks, frays, or bent plug prongs. See that the chassis is grounded.	Par. 9 and figs. 7, 8, and 9.

Pages 13 and 14. Delete figures 5 and 6.

Page 15. Delete paragraph 18 and substitute:

18. Scope of Organizational Maintenance

The second echelon maintenance procedures to be performed on the LS–147(*)/FI consist of the following:

a. Quarterly preventive maintenance (pars. 20, 21, and 21.1).

b. Troubleshooting (par. 22).

c. Replacement of tubes (par. 23).

d. Replacement of pilot lamps (par. 24).

Delete paragraphs 20 and 21 and substitute:

20. Preventive Maintenance (Second Echelon)

a. Preventive maintenance at second echelon includes inspection, testing, and repair or replacement of parts that would probably fail before the next scheduled periodic service. Preventive maintenance checks and services of the LS–147(*)/FI at the second echelon maintenance level are made at quarterly intervals unless otherwise directed by the commanding officer. The preventive maintenance checks and services should be scheduled concurrently with the periodic service schedule of the carrying vehicle for all vehicular installations.

b. Maintenance forms and records to be used and maintained on the LS–147(*)/FI are specified in TM 38–750.

21. Quarterly Maintenance

Quarterly preventive maintenance checks and services on the LS–147(*)/FI are required. All deficiencies or shortcomings will be recorded in accordance with the requirements of TM 38–750. Perform all the checks and services listed in the quarterly preventive maintenance checks and services chart (par. 21.1) in the sequence indicated.

Add paragraph 21.1 after 21.

21.1. Quarterly Preventive Maintenance Checks and Services Chart

Sequence No.	Item	Procedure	References
1	LS–147(*)/FI	Remove chassis from cabinet and remove dust and dirt from cabinet interior and chassis; use a soft lint-free cloth.	Figs. 7, 8, and 9.
2	Tubes	Make sure that correct tubes are installed and securely seated.	Par. 23 and figs. 7, 8, and 9.
3	Fuses	Check to see that the fuse is of the correct value.	Par. 17 and figs. 7, 8, and 9.
4	Speaker-microphone	Inspect speaker-microphone cone for cracks or looseness.	None.
5	Chassis-mounted components	Inspect chassis-mounted components for signs of damage due to shorts or overheating.	None.
6	Chassis surface	Check chassis and interior of cabinet for rust or corrosion. Remove rust and corrosion and spot-paint bare surfaces.	TM 9–213.
7	Publications	See that all publications are complete, serviceable, and current.	DA Pam 310–4.
8	Modifications	Check DA Pam 310–4 to determine if new applicable MWO's have been published. All URGENT MWO's must be applied immediately. All ROUTINE MWO's must be scheduled.	TM 38–750 and DA Pam 310–4.

Page 21. **Delete appendix I and substitute:**

APPENDIX I
REFERENCES

Following is a list of applicable references that are available to the operator and organizational maintenance personnel of Intercommunication Stations LS–147A/FI, LS–147B/FI, LS–147C/FI, and LS–147D/FI.

AR 700–58	**Report of Damaged or Improper Shipment.**
DA PAM 310–4	**Military Publications: Index of Technical Manuals, Technical Bulletins, Supply Bulletins, Lubrication Orders, and Modification Work Orders.**
TM 9–213	**Painting Instructions for Field Use.**
TM 11–5830–221–20P	**Organizational Maintenance Repair Parts and Special Tools List: Intercommunication Stations LS–147A/FI, LS–147B/FI, LS–147C/FI, and LS–147D/FI.**
TM 11–6625–274–12	**Operator's and Organizational Maintenance Manual: Test Sets, Electron Tube TV–7/U, TV–7A/U, TV–7B/U, and TV–7D/U.**
TM 38–750	**The Army Equipment Record System and Procedures.**

Page 22. Delete appendixes II and III and substitute:

APPENDIX II

MAINTENANCE ALLOCATION

Section I. INTRODUCTION

1. General

a. This section assigns maintenance functions to be performed on components, assemblies, and subassemblies by the lowest appropriate maintenance echelon.

b. Columns in the maintenance allocation chart are as follows:

(1) *Component.* This column shows only the nomenclature or standard item name. Additional descriptive data is included only where clarification is necessary to identify the component. Components, assemblies, and subassemblies are listed in top-down order. That is, the assemblies which are part of a component are listed immediately below that component, and the subassemblies which are part of an assembly are listed immediately below that assembly. Each generation breakdown (component, assemblies, or subsemblies) are listed in disassembly order or alphabetical order.

(2) *Maintenance function.* This column indicates the various maintenance functions allocated to the echelons.

(*a*) *Service.* To clean, to preserve, and to replenish lubricants.

(*b*) *Adjust.* To regulate periodically to prevent malfunction.

(*c*) *Inspect.* To verify serviceability and to detect incipient electrical or mechanical failure by scrutiny.

(*d*) *Test.* To verify serviceability and to detect incipient electrical or mechanical failure by use of special equipment such as gages, meters, etc.

(*e*) *Replace.* To substitute serviceable components, assemblies, or subassemblies, for unserviceable components, assemblies, or subassemblies.

(*f*) *Repair.* To restore an item to serviceable condition through correction of a specific failure or unserviceable condition. This function includes but is not limited to welding, grinding, riveting, straightening, and replacement of parts other than the trial and error replacement of running spare type items such as fuses, lamps, or electron tubes.

(*g*) *Align.* To adjust two or more components of an electrical system so that their functions are properly synchronized.

(*h*) *Calibrate.* To determine, check, or rectify the graduation of an instrument, weapon, or weapons system, or components of a weapons system.

(*i*) *Overhaul.* To restore an item to *completely serviceable* condition as prescribed by serviceability standards. This is accomplished through employment of the technique of "Inspect and repair only as necessary" (IROAN). Maximum utilization of diagnostic and test equipment is combined with minimum disassembly of the item during the overhaul process.

(*j*) *Rebuild.* To restore an item to a standard as near as possible to original or new condition in appearance, performance, and life expectancy. This is accomplished through the maintenance technique of complete disassembly of the item, inspection of all parts or components, repair or replacement of worn or unserviceable elements using original manufacturing tolerances and/or specifications and subsequent reassembly of the item.

(3) *1st, 2d, 3d, 4th, 5th echelons.* The symbol X placed in columns 3 through 7 indicates the echelon responsible for performing that particular maintenance operation, but does not necessarily indicate that repair parts will be stocked at that level. Echelons higher than the echelon marked by X are authorized to perform the indicated operation.

(4) *Tools required.* This column indicates codes assigned to each individual tool equipment, test equipment, and maintenance equipment referenced. The grouping of codes in this column of the maintenance allocation chart indicates the tool, test, and maintenance equipment required to perform the maintenance function.

(5) *Remarks.* Entries in this column will be utilized when necessary to clarify any of the data cited in the preceding column.

c. Columns in the allocation of tools for maintenance functions are as follows:

(1) *Tools required for maintenance functions.* This column lists tools, test, and maintenance equipment required to perform the maintenance functions.

(2) *1st, 2d, 3d, 4th, 5th echelon.* The dagger (†) symbol in these columns indicates the echelons normally allocated the facility.

(3) *Tool code.* This column lists the tool code assigned.

2. Maintenance by Using Organizations

When this equipment is used by signal services organizations organic to theater headquarters or communication zones to provide theater communications, those maintenance functions allocated up to and including fourth echelon are authorized to the organization operating this equipment.

SECTION II. MAINTENANCE ALLOCATION CHART

PART OR COMPONENT	MAINTENANCE FUNCTION	ECHELON 1	2	3	4	5	TOOLS REQUIRED	REMARKS
INTERCOMMUNICATION STATIONS LS-147A/F1, LS-147B/F1, LS-147C/F1, LS-147D/F1	service		X				9	
	inspect		X				9	
	test		X				2,6	Continuity, voltage and resistance tests
				X			2,4,6	Distortion, voltages and resistance measurements
					X		1,2,4,6,10	Final testing, Tool code 5 replaces Tool Code 6 in 5th echelon only
	repair		X				9	Replace tubes, knobs, pluck out items.
				X			7,8	All repairs
	overhaul				X		7,8	

SECTION III. ALLOCATION OF TOOLS FOR MAINTENANCE FUNCTIONS

TOOLS REQUIRED FOR MAINTENANCE FUNCTIONS	ECHELON 1	2	3	4	5	TOOL CODE	REMARKS
LS-147A/F1, LS-147B/F1, LS-147C/F1, LS-147D/F1 (continued)							
ANALYZER SPECTRUM TS-723/U				†	†	1	
AUDIO OSCILLATOR TS-382/U			†	†	†	2	
MULTIMETER METER AN/URM-105		†				3	
MULTIMETER METER TS-352/U			†	†	†	4	
TEST SET ELECTRON TUBE TV-2/U					†	5	
TEST SET ELECTRON TUBE TV-7/U		†	†	†		6	
TOOL KIT TK-87/U			†	†	†	7	
TOOL KIT TK-88/U			†	†	†	8	
TOOL KIT TK-115/U		†				9	
VOLTMETER METER ME-30/U				†	†	10	

END

APPENDIX III

BASIC ISSUE ITEMS

Section I. INTRODUCTION

1. General

This appendix lists items supplied for initial operation. End items of equipment are issued on the basis of allowances prescribed in equipment authorization tables and other documents that are a basis for requisitioning.

2. Columns

Columns are as follows:

a. Federal Stock Number. This column lists the 11-digit Federal stock number.

b. Designation by Model. The dagger (†) indicates model in which the part is used.

c. Description. Nomenclature or the standard item name and brief identifying data for each item are listed in this column. When requisitioning, enter the nomenclature and description.

d. Unit of Issue. The unit of issue is each unless otherwise indicated and is the supply term by which the individual item is counted for procurement, storage, requisitioning, allowances, and issue purposes.

e. Expendability. Nonexpendable items are indicated by NX. Expendable items are not annotated.

f. Quantity Authorized. Under "Items Comprising an Operable Equipment," the column lists the quantity of items supplied for the initial operation of the equipment.

g. Illustrations. Not used.

SECTION II. FUNCTIONAL PARTS LIST

FEDERAL STOCK NUMBER	DESIGNATION BY MODEL						DESCRIPTION	UNIT OF ISSUE	EXP	QTY AUTH	ILLUSTRATION	
											FIGURE NO.	ITEM NO.
5830-222-1661							INTERCOMMUNICATION STATION LS-147A/FI: two way comm over single pair wire which interconnects all other stations in the network; non-selective; amplifier incl; wood cabinet; continental Electronics Model #8-47A					
5830-681-8616							INTERCOMMUNICATION STATION LS-147B/FI: Two-way comm over single pair wire which interconnects all other stations in network; non selective, amplifier incl; steel cabinet; continental Electronics Model #8-47B					
5830-752-5357							INTERCOMMUNICATION STATION LS-147C/FI: two-way comm over single pair wire which interconnects all other stations in network; Non-selective; amplifier incl; gain control f/xnitting; Level control for receiving; steel cabinet; st Carl dwg #809000-100					
5830-752-5355							INTERCOMMUNICATION STATION LS-147D/FI: Two-way comm over single pair wire which interconnects all other stations in network; non-selective; amplifier; ST-Carl dwg No. 666/76					
							ITEMS COMPRISING AN OPERABLE EQUIPMENT					
							NOTE: Model Column 1 refers to LS-147A/FI, Column 2 refers to LS-147B/FI, Column 3 refers to LS-147C/FI, Column 4 refers to LS-147D/FI					
	†						INTERCOMMUNICATION STATION LS-147A/FI (Basic component)		NX	1		
		†					INTERCOMMUNICATION STATION LS-147B/FI: (BASIC COMPONENT)		NX	1		
			†				INTERCOMMUNICATION STATION LS-147C/FI: (BASIC COMPONENT)		NX	1		
				†			INTERCOMMUNICATION STATION LS-147D/FI: (BASIC COMPONENT)		NX	1		
Ord thru AGC	†	†	†	†			TECHNICAL MANUAL TM-11-5830-221-12			1		
							RUNNING SPARE ITEMS No parts authorized for stockage at 1st echelon					

By Order of the Secretary of the Army:

EARLE G. WHEELER,
General, United States Army,
Chief of Staff.

Official:

J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

Distribution:

Active Army:

DASA (6)
USASA (2)
CNGB (1)
CofEngrs (1)
TSG (1)
CSigO (5)
CofT (1)
USA CD Agcy (1)
USCONARC (5)
USAMC (5)
ARADCOM (2)
ARADCOM Rgn (2)
OS Maj Comd (3)
OS Base Comd (2)
LOGCOMD (2
USAECOM (5)
USAMICOM (3)
USASCC (4)
MDW (1)
Armies (2)
Corps (2)
USA Corps (3)
USATC AD (2)
USATC Engr (2)
USATC Inf (2)
USATC Armor (2)
Instls (2) except
Ft Monmouth (63)
Svc College (2)
Br Svc Sch (2)
GENDEP (OS) (2)
Sig Dep (OS) (12)
Sig Sec, GENDEP (5)
Army Dep (2) except
Ft Worth (8)
Lexington (12)
Sacramento (28)
Tobyhanna (12)
USA Elct RD Actv, White Sands (13)
USA Elct RD Actv, Ft Huachuca (2)
USA Trans Tml Comd (1)
Army Tml (1)
POE (1)
USAOSA (1)
AMS (1)
WRAMC (1)
AFIP (1)
Army Pic Cen (2)
USA Mbl Spt Cen (1)
USA Elct Mat Agcy (12)
Chicago Proc Dist (1)
USARCARIB Sig Agcy (1)
Sig Fld Maint Shop (3)
C/Spt Svcs (1)
Units org under fol TOE:
Two copies each:

7	11-98
7-52	11-117
9-47	11-137
9-87	11-155
9-227	11-500 (AA-AC, RM-RU)
9-377	11-555
9-500 (AA-AC)	11-557
11-5	11-587
11-6	11-592
11-7	11-597
11-8	17
11-15	37
11-16	44-435
11-36	44-436
11-37	44-437
11-38	44-446
11-55	44-535
11-56	44-536
11-57	44-537
11-58	44-544
11-85	44-546
11-86	44-548
11-96	54-2
11-97	54-102

NG: None.

USAR: None.

For explanation of abbreviations used, see AR 320-50.

TM 11–5830–221–12
C 2

CHANGE
No. 2

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *11 December 1973*

Operator's and Organizational Maintenance Manual
INTERCOMMUNICATION STATIONS LS–147A/FI LS–147B/FI LS–147C/FI AND LS–147D/FI

TM–11–5830–221–12, 5 June 1961, is changed as follows:

Page 5. Paragraph 1.1 is superseded as follows:

1.1. Indexes of Publications

a. DA Pam 310–4. Refer to the latest issue of DA Pam 310–4 to determine whether there are new editions, changes, or additional publications pertaining to the equipment.

b. DA Pam 310–7. Refer to DA Pam 310–7 to determine whether there are modification work orders (MWO's) pertaining to the equipment.

Paragraph 2 is superseded as follows:

2. Forms and Records

a. Reports of Maintenance and Unsatisfactory Equipment. Maintenance forms, records, and reports which are to be used by maintenance personnel at all maintenance levels are listed in and prescribed by TM 38–750.

b. Report of Packaging and Handling Deficiencies. Fill out and forward DD Form 6 (Report of Packaging and Handling Deficiencies) as prescribed in AR 700–58 (Army)/NAVSUP PUB 378 (Navy)/AFR 71–4 (Air Force)/and MCO P4030.29 (Marine Corps).

c. Discrepancy in Shipment Report (DISREP) (SF 361). Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55–38 (Army)/NAVSUP PUB 459 (Navy)/AFM 75–34 (Air Force)/and MCO P4610.19 (Marine Corps).

Paragraph 2.1 is added as follows:

2.1. Reporting of Equipment Publication Improvements

The reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to Publications) and forwarded direct to Commander, US Army Electronics Command, ATTN: AMSEL–MA–C, Fort Monmouth, NJ 07703.

Page 6. Paragraph 5 is superseded as follows:

5. Items Comprising an Operable Equipment

FSN	Qty	Nomenclature, part No., and mfr code	Usable-on code
		NOTE The part number is followed by the applicable 5-digit Federal supply code for manufacturers (FSCM) identified in SB 708–42 and used to identify manufacturer, distributor, or Government agency; etc.	
		NOTE Number 1 in the usable-on code column refers to LS–147A/FI; number 2 refers to LS–147B/FI; number 3 refers to LS–147C/FI; and number 4 refers to LS–147D/FI.	
5830–222–1661	1	Intercommunication Station LS–147A/FI (Basic Component).	1
5830–681–8616	1	Intercommunication Station LS–147B/FI (Basic Component).	2
5830–752–5357	1	Intercommunication Station LS–147C/FI (Basic Component).	3
5830–752–5355	1	Intercommunication Station LS–147D/FI (Basic Component).	4

Page 26. appendix III is deleted in its entirety.

By Order of the Secretary of the Army:

CREIGHTON W. ABRAMS
General, United States Army
Chief of Staff

Official:

VERNE L. BOWERS
Major General, United States Army
The Adjutant General

Distribution:

Active Army:

USASA (2)
CNGB (1)
ACSC-E (2)
Dir of Trans (1)
COE (1)
TSG (1)
USAARENBD (1)
USAMB (10)
AMC (1)
TRADOC (2)
ARADCOM (2)
ARADCOM Rgn (2)
OS Maj Comd (4)
LOGCOMDS (3)
MICOM (2)
TECOM (2)
USACC (4)
MDW (1)
Armies (2)
Corps (2)
HISA (ECOM) (21)
Svc Colleges (1)
USASESS (5)
USAADS (2)
USAFAS (2)
USAARMS (2)
USAIS (2)
USAES (2)
USAINTS (3)
WRAMC (1)
USACDCEC (10)
ATS (1)
Instl (2) except:
Fort Gordon (10)
Fort Huachuca (10)
Fort Carson (5)
Ft Richardson (ECOM Ofc) (2)
WSMR (1)
Army Dep (2) except:
LBAD (14)
SAAD (30)
TOAD (14)
ATAD (10)
USA Dep (2)
Sig Sec USA Dep (2)
Sig Dep (2)
Sig FLDMS (1)
USAERDAA (1)
USAERDAW (1)
MAAG (1)
USARMIS (1)
Units org under for TOE (1 copy each):

7	11-500 (AA-AC)
9-47	17
11-15	29-134
11-16	29-136
11-36	37
11-37	44-435
11-38	44-436
11-85	44-437
11-86	44-535
11-96	44-536
11-97	44-537
11-98	44-546
11-117	44-548
11-137	54-2
11-302	54-502

NG: None
USAR: None
For explanation of abbreviations used, see AR 310-50.

Change No. 3

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, *14 September 1979*

Operator's and Organizational Maintenance Manual
INTERCOMMUNICATION STATIONS
LS-147A/FI, LS-147B/FI, LS-147C/FI AND LS-147D/FI
(NSN 5830-00-752-5357)

TM 11-5830-221-12, 5 June 1961, is changed as follows:

The title of the manual is changed as shown above.

Page 5. Paragraphs 2*b* and 2*c* are superseded as follows:

b. Report of Packaging and Handling Deficiencies. Fill out and forward DD Form 6 (Packaging Improvement Report) as prescribed in AR 700-58/NAVSUPINST 4030.29/AFR 71-13/MCO P40-30.29A and DLAR 4145.8.

c. Discrepancy in Shipment Report (DISREP) (SF 361). Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38/NAVSUPINST 4610.33B/AFR 75-18/MCO P4610.19C and DLAR 4500.15.

Paragraph 2.1 is superseded as follows:

2.1 Reporting Errors and Recommending Improvements

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, or DA Form 2028 (Recommended Changes to Publications and Blank Forms) to Commander, US Army Communications and Electronics Materiel Readiness Command, ATTN: DRSEL-ME-MQ, Fort Monmouth, NJ 07703. A reply will be furnished direct to you.

Paragraph 2.2 is added after 2.1:

2.2 Reporting Equipment Improvement Recommendations (EIR)

If your LS-147( )/FI needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Tell us why a procedure is hard to perform. Put it on an SF 368 (Quality Deficiency Report). Mail it to: Commander, US Army Communications and Electronics Materiel Readiness Command, ATTN: DRSEL-ME-MQ, Fort Monmouth, NJ 07703. We'll send you a reply.

The maintenance duties assigned to the operator of the LS-147(*)/FI are listed below together with a reference to the paragraph covering the specific maintenance function. The duties assigned require no special tools or test equipment.

a. Operator's preventive maintenance checks and services chart (para 14.2).

b. Visual inspection (para 15).

c. Troubleshooting by use of the equipment performance checklist (para 16).

d. Replacing fuses (para 17).

14. Operator's Preventive Maintenance

Preventive maintenance is the systematic servicing, and inspection of equipment to prevent the occurrence of trouble, to reduce downtime, and to assure that the equipment is in serviceable condition. To assist in maintaining serviceability, the chart (para 14.2) indicates what to check, how to check, and what the normal conditions are. If the defect cannot be remedied, higher category maintenance or repair is required. Records and reports of these checks and services must be made in accordance with requirements set forth in TM 38-750. The procedures given in paragraph 14.2 cover routine systematic care for proper upkeep and operation of the equipment.

14.1 Operator's Preventive Maintenance Checks and Services Periods

To be sure that your intercommunication station is ready for your mission, you must perform your WEEKLY (W) Preventive Maintenance Checks and Services (PMCS). When you are doing any PMCS or routine checks, keep in mind the warnings and cautions.

NOTES

Routine checks like cleaning, dusting, washing, checking for frayed cables, stowing items not in use, covering unused receptacles and checking for loose screws are not listed as PMCS checks. They are things that you should do anytime you see they must be done.

If your equipment must be kept in continuous operation, check and service those items that can be checked and serviced without disturbing operation. Make the complete checks and services when the equipment can be shut down.

Use the ITEM NO. column in your PMCS table as a source of numbers for the TM Item No. column on DA Form 2404 (Equipment Inspection and Maintenance Worksheet) in recording results of PMCS.

Deficiencies that cannot be corrected must be reported to higher category maintenance personnel. Records and reports of preventive maintenance must be made in accordance with procedures given in TM 38-750.

14.2 Operator's Preventive Maintenance Checks and Services Chart

NOTES

Perform the following checks before operation and weekly if:
1. You are the assigned operator and have not operated the item since the last weekly, or
2. You are operating the item for the first time.
Perform the checks in the order listed.

(W) WEEKLY

ITEM NO.	INTERVAL W	ITEM TO BE INSPECTED	PROCEDURES	EQUIPMENT IS NOT READY/ AVAILABLE IF:
1	X	Connection	Ensure that the intercommunication station connections have been properly made (para 9).	Equipment not properly connected.
2	X	Equipment operation	*a.* Operate the equipment (para 16c, items 4 through 7).	*a.* Equipment fails to operate properly.
			b. Observe that the mechanical action of each control and switch is free from binding.	*b.* Control or switch binds.

Paragraph 14.3 is rescinded.

Page 15. Paragraphs 18 and 19 are superseded as follows:

18. Scope of Organizational Maintenance

The maintenance duties assigned to the organizational repair person are listed below, together with reference to the paragraphs covering the specific maintenance functions. The required tools and test equipment are listed in paragraph 19.

a. Organizational preventive maintenance checks and services chart (para 21.1).

b. Troubleshooting (para 22).

c. Tube testing and replacement (para 23).

d. Removal and replacement of pilot lamp (para 24).

19. Tools and Test Equipment

The tools and test equipment required for organizational maintenance are listed in SECTION III of APPENDIX II, MAINTENANCE ALLOCATION.

Paragraphs 20, 21, and 21.1 are superseded as follows:

20. Organizational Preventive Maintenance

Preventive maintenance is the systematic care, servicing, and inspection of equipment to prevent the occurrence of trouble, to reduce downtime, and to assure that the equipment is in serviceable condition. To assist in maintaining serviceability, the chart (para 21.1) indicates what to check, how to check, and what the normal conditions are. If the defect cannot be remedied, higher category maintenance or repair is required. Records and reports of these checks and services must be made in accordance with the requirements set forth in TM 38-750. The procedures given in paragraph 21.1 cover routine systematic care and cleaning for proper upkeep and operation of the equipment.

21. Organizational Preventive Maintenance Checks and Service Periods

To be sure that your intercommunication station is ready for your mission, you must perform your QUARTERLY (Q) Preventive Maintenance Checks and Services (PMCS). When you are doing any PMCS or routine checks, keep in mind the warnings and cautions.

NOTES

Routine checks like cleaning, dusting, washing, checking for frayed cables, stowing items not in use, covering unused receptacles and checking for loose screws are not listed as PMCS checks. They are things that you should do anytime you see they must be done.

Use the ITEM NO. column in your PMCS table as a source of number for the TM Item No. column on DA Form 2404 (Equipment Inspection and Maintenance Worksheet) in recording results of PMCS.

Deficiencies that cannot be corrected must be reported to higher category maintenance personnel. Records and reports of preventive maintenance must be made in accordance with procedures given in TM 38-750.

21.1 Organizational Preventive Maintenance Checks and Services Chart

(Q) Quarterly

ITEM NO.	INTERVAL Q	ITEM TO BE INSPECTED	PROCEDURE
1	X	Modifications	Check DA Pam 310-7 to determine whether new applicable MWO's have been published. All urgent MWO's must be applied immediately. All normal MWO's must be scheduled.
2	X	Speaker-Microphone	Inspect speaker-microphone cone for cracks or looseness. There should be no evidence of cracks or looseness.

Page 21, Appendix I: The following is added to the list of references:

DA Pam 310-7	US Army Equipment Index of Modification Work Orders.	TM 11-6625-203-12	Operator and Organizational Maintenance: Multimeter AN/URM-105, and AN/URM-105C Including Multimeter ME-77/U and ME-77C/U.

Page 22. Appendix II is superseded as follows:

APPENDIX II
MAINTENANCE ALLOCATION

Section I. INTRODUCTION

II-1. General

This appendix provides a summary of the maintenance operations for Intercommunication Stations LS-147A/FI, LS-147B/FI, LS-147C/FI and LS-147D/FI. It authorizes categories of maintenance for specific maintenance functions on repairable items and components and the tools and equipment required to perform each function. This appendix may be used as an aid in planning maintenance operations.

II-2. Maintenance Function.

Maintenance functions will be limited to and defined as follows:

a. Inspect. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination.

b. Test. To verify serviceability and to detect incipient failure by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean (decontaminate), to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

d. Adjust. To maintain, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to the specified parameters.

e. Align. To adjust specified variable elements of an item to bring about optimum or desired performance.

f. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test measuring and diagnostic equipments used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. Install. The act of emplacing, seating, or fixing into position an item, part, module (component or assembly) in a manner to allow the proper functioning of the equipment or system.

h. Replace. The act of substituting a serviceable like type part, subassembly, or module (component or assembly) for an unserviceable counterpart.

i. Repair. The application of maintenance services (inspect, test, service, adjust, align, calibrate, replace) or other maintenance actions (welding, grinding, riveting, straightening, facing, remachining, or resurfacing) to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

j. Overhaul. That maintenance effort (service/action) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards (i.e., DMWR) in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

k. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours, miles, etc.) considered in classifying Army equipments/components.

II-3. Column Entries.

a. Column 1, Group Number. Column 1 lists group numbers, the purpose of which is to identify components, assemblies, subassemblies, and modules with the next higher assembly.

b. Column 2, Component/Assembly. Column 2 contains the noun names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. Column 3, Maintenance Functions. Column 3 lists the functions to be performed on the item listed in column 2. When items are listed without maintenance functions, it is solely for purpose of having the group numbers in the MAC and RPSTL coincide.

d. Column 4, Maintenance Category. Column 4 specifies, by the listing of a "worktime" figure in the appropriate subcolumn(s), the lowest level of maintenance authorized to perform the function listed in column 3. This figure represents the active time required to perform that maintenance function at the indicated category of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance categories, appropriate "worktime" figures will be shown for each category. The number of task-hours specified by the "worktime" figure represents the average time required to restore an item (assembly, subassembly, component, module, end item or system) to a serviceable condition under typical field operating conditions. This time includes preparation time, troubleshooting time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. Subcolumns of column 4 are as follows:

C-Operator/Crew
O-Organizational
F-Direct Support
H-General Support
D-Depot

e. Column 5, Tools and Equipment. Column 5 specifies by code, those common tool sets (not individual tools) and special tools, test, and support equipment required to perform the designated function.

f. Column 6, Remarks. Column 6 contains an alphabetic code which leads to the remark in section IV, Remarks, which is pertinent to the item opposite the particular code.

II-4. Tool and Test Equipment Requirements (Sect. III).

a. Tool and Test Equipment Reference Code. The numbers in this column coincide with the numbers used in the tools and equipment column of the MAC. The numbers indicate the applicable tool or test equipment for the maintenance functions.

b. Maintenance Category. The codes in this column indicate the maintenance category allocated the tool or test equipment.

c. Nomenclature. This column lists the noun name and nomenclature of the tools and test equipment required to perform the maintenance functions.

d. National/NATO Stock Number. This column lists the National/NATO stock number of the specific tool or test equipment.

e. Tool Number. This column lists the manufacturer's part number of the tool followed by the Federal Supply Code for manufacturers (5-digit) in parentheses.

II-5. Remarks (Sect. IV).

a. Reference Code. This code refers to the appropriate item in section II, column 6.

b. Remarks. This column provides the required explanatory information necessary to clarify items appearing in section II.

SECTION II MAINTENANCE ALLOCATION CHART FOR

INTERCOMMUNICATION STATIONS LS-147A, B, C, AND D/FI

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQPT.	(6) REMARKS
			C	O	F	H	D		
00	INTERCOMMUNICATION STATIONS LS-147A/FI, LS-147B/FI, LS-147C/FI, AND LS-147D/FI. Organizational test will be limited to equipment operation. Organizational repair will be limited to replacement of fuse, knobs, and tubes.	Inspect		0.3					
		Test		0.5				1,7	
		Test			1.0			5 thru 10	
		Service		0.5				2	
		Repair		1.0				1,2,7	
		Repair			2.0			3 thru 10	
		Overhaul					5.0	1 thru 10	

SECTION III TOOL AND TEST EQUIPMENT REQUIREMENTS FOR INTERCOMMUNICATION STATIONS LS-147A, B, C, AND D/FI

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
1	O, F, H, D	MULTIMETER AN/URM-105	6625-00-581-2036	
2	O, F, H, D	TOOL KIT, ELECTRONIC EQUIPMENT TK-101/G	5180-00-064-5178	
3	F, H, D	TOOL KIT, ELECTRONIC EQUIPMENT TK-100/G	5180-00-605-0079	
4	F, H, D	TOOL KIT, ELECTRONIC EQUIPMENT TK-105/G	5180-00-610-8177	
5	F, H, D	MULTIMETER AN/USM-223	6625-00-999-7465	
6	F, H, D	ELECTRONIC VOLTMETER ME-30(*)/U	6625-00-543-1670	
7	O, F, H, D	TEST SET, ELECTRON TUBE TV-7(*)/U	6625-00-820-0064	
8	F, H, D	TEST SET, ELECTRON TUBE TV-2(*)/U	6625-00-669-0263	
9	F, H, D	AUDIO OSCILLATOR TS-382(*)/U	6625-00-151-7479	
10	F, H, D	SPECTRUM ANALYZER TS-723/U	6625-00-668-9418	

By Order of the Secretary of the Army:

E. C. MEYER
General, United States Army
Chief of Staff

Official:

J. C. PENNINGTON
Major General, United States Army
The Adjutant General

DISTRIBUTION:
Active Army
USAINSCOM (2)
COE (1)
TSG (1)
USAARENBD (1)
DARCOM (1)
TRADOC (2)
OS Maj Comd (4)
TECOM (2)
USACC (4)
MDW (1)
Armies (2)
Corps (2)
Svc Colleges (1)
USASIGS (5)
USAADS (2)
USAFAS (2)
USAARMS (2)
USAIS (2)
USAES (2)
USAICS (3)
MAAG (1)
USARMIS (1)
USAERDAA (1)
USAERDAW (1)
Fort Gillem (10)
Fort Gordon (10)
Fort Carson (5)
Fort Huachuca (10)
Ft Monmouth(HISA) (21)
Ft Richardson(ECOM) (2)
Army Dep (1, except
LBAD (14)
SAAD (30)
TOAD (14)
SHAD (3)
USA Dep (1)
Sig Sec USA Dep (1)

Units org under fol TOE:
(1 cy each unit, UNOINDC)
29-207 (2)
29-610 (2)
7
9-47
11-15
11-16
11-36
11-37
11-38
11-85
11-86
11-96
11-97
11-98
11-117
11-137
11-302
11-500(AA-AC)
17
29-134
29-136
37
44-435
44-436
44-437
44-535
44-536
44-537
44-546

ARNG: None
USAR: None

For explanation of abbreviations used, see AR 310-50.

			Paragraph	Page
CHAPTER	1.	INTRODUCTION		
Section	I.	General		
		Scope	1	5
		Forms and records	2	5
	II.	Description and data		6
		Purpose and use	3	6
		Technical characteristics	4	6
		Table of components	5	6
		Description	6	6
		Differences in models	7	6
CHAPTER	2.	INSTALLATION AND OPERATION		
Section	I.	Service upon receipt of equipment		7
		Unpacking and checking	8	7
		Installation	9	7
	II.	Operation		9
		Controls and indicator	10	9
		Operation under usual conditions	11	10
		Operation under unusual conditions	12	10
CHAPTER	3.	MAINTENANCE INSTRUCTIONS		
Section	I.	Operator's maintenance		11
		Scope of operator's maintenance	13	11
		Preventive maintenance	14	11
		Visual inspection	15	11
		Equipment performance checklist	16	11
		Replacing fuses	17	12
	II.	Organizational maintenance		15
		Scope of organizational maintenance	18	15
		Tools and test equipment	19	15
		Preventive maintenance	20	15
		Visual inspection	21	15
		Troubleshooting checklist	22	15
		Tube testing and replacement	23	16
		Removal and replacement of pilot lamp	24	16
CHAPTER	4.	SHIPMENT AND LIMITED STORAGE AND DEMOLITION TO PREVENT ENEMY USE		
Section	I.	Shipment and limited storage		20
		Disassembly of equipment	25	20
		Repacking for shipment of limited storage	26	20
	II.	Demolition of material to prevent enemy use		20
		Authority for demolition	27	20
		Methods of destruction	28	20
APPENDIX	I.	REFERENCES		21
	II.	MAINTENANCE ALLOCATION		22
	III.	BASIC ISSUE ITEMS		26

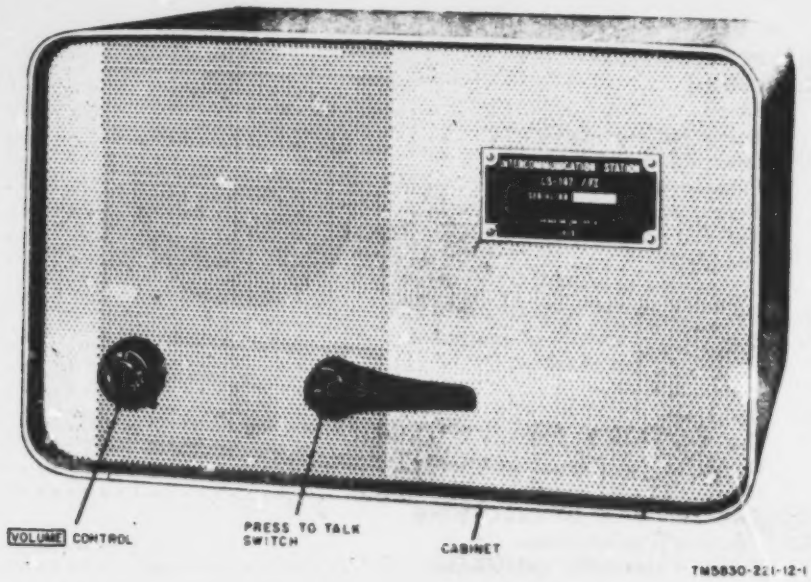

Figure 1. Intercommunication Stations LS-147A/FI or LS-147B/FI.

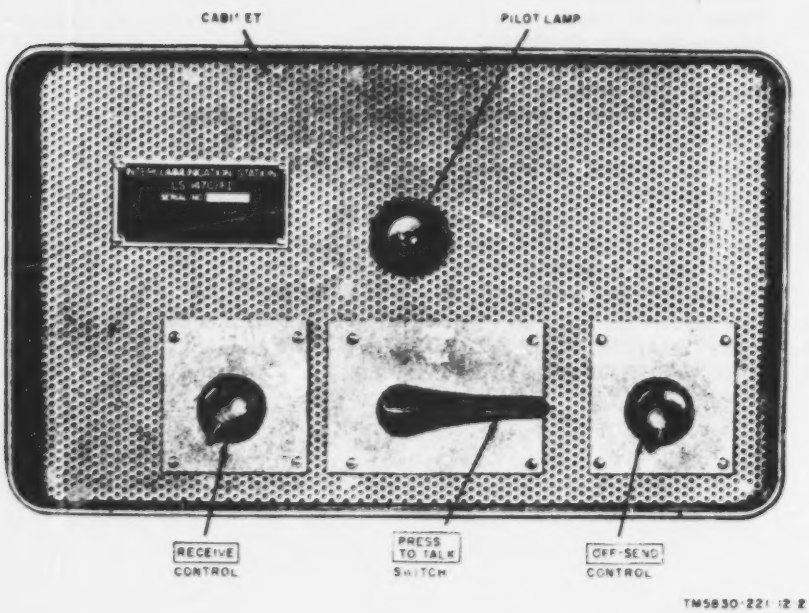

Figure 2. Intercommunication Station LS-147C/FI.

CHAPTER 1
INTRODUCTION

Section I. GENERAL

1. Scope

a. This manual describes Intercommunication Stations LS-147A/FI, LS-147B/FI, LS-147C/FI, and LS-147D/FI and covers their installation, operation, and operator's and organizational maintenance. It includes operation under usual and unusual conditions, cleaning and inspection of the equipment, and replacement of parts available for first and second echelon maintenance.

b. Official nomenclature followed by (*) is used to indicate all models of the equipment item covered in this manual. Thus, Intercommunication Station LS-147(*)/FI represents Intercommunication Stations LS-147A/FI, LS-147B/FI, LS-147C/FI, and LS-147D/FI.

2. Forms and Records

a. Unsatisfactory Equipment Report.

(1) Fill out and forward DA Form 468 (Unsatisfactory Equipment Report) to the Commanding Officer, U. S. Army Signal Materiel Support Agency, ATTN: SIGMS-ML, Fort Monmouth, N. J., as prescribed in AR 700-38.

(2) Fill out and forward AF TO Form 29 (Unsatisfactory Report) to the Commander, Air Materiel Command, Wright-Patterson Air Force Base, Ohio, as prescribed in AF TO 00-35D-54.

b. Report of Damaged or Improper Shipment. Fill out and forward DD Form 6 (Re-

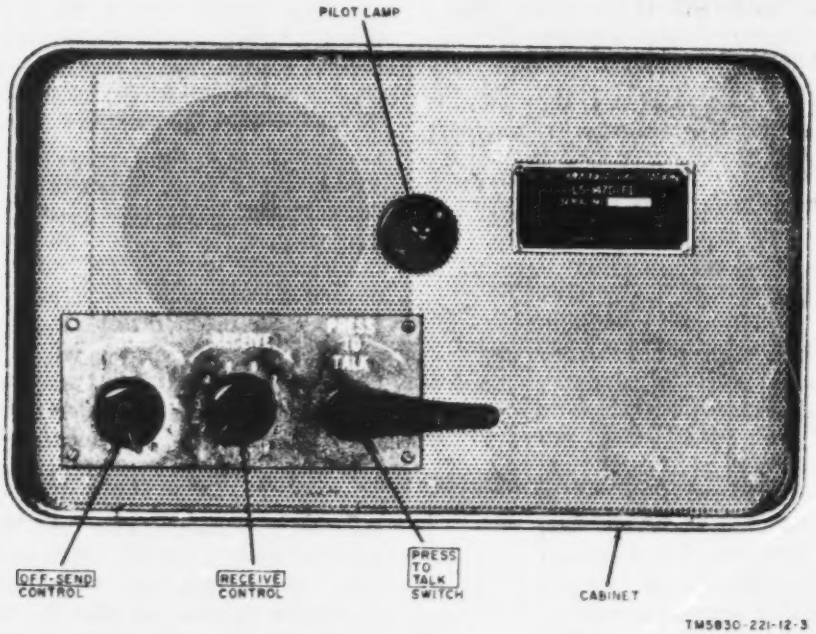

Figure 3. Intercommunication Station LS-147D/FI.

port of Damaged or Improper Shipment) as prescribed in AR 700-58 (Army), Navy Shipping Guide, Article 1850-4 (Navy), and AFR 71-4 (Air Force).

c. Preventive Maintenance Forms. Prepare DA Form 11-238 (fig. 5 and 6) (Maintenance Check List for Signal Equipment (Sound Equipment, Radio, Direction Finding, Radar, Carrier, Radiosonde and Television)) in accordance with instructions on page 1 of the form.

d. Parts List Form. Forward DA Form 2028 (Recommended Changes to DA Technical Manual Parts Lists or Supply Manual 7, 8, or 9) direct to the Commanding Officer, U. S. Army Signal Materiel Support Agency, ATTN: SIGMS-ML, Fort Monmouth, N. J., for comments on appendixes II and III.

e. Comments on Manual. Forward all other comments on this publication direct to the Commanding Officer, U. S. Army Signal Materiel Support Agency, ATTN: SIGMS-PA2d, Fort Monmouth, N. J.

Section II. DESCRIPTION AND DATA

3. Purpose and Use

The LS-147(*)/FI provides two-way audio communications between two or more points. The LS-147(*)/FI may be used in an intercommunication system for a maximun of seven shelters or offices.

4. Technical Characteristics

Power output . . . . . 4 watts.
Input and output resistances . . . . . 12 ohms (max).
Voltage requirements . . . . . 115 volts ac, 60 cps.
Power consumption:
LS-147A/FI, LS-147B/FI, and LS-147D/FI . . . . . 32 watts.
LS-147C/FI . . . . . 40 watts.
Note. No power is required for reception alone
Weight . . . . . 11 lbs.
Number of vacuum tubes . . . . . 3.

5. Table of Components

The components of the LS-147(*)/FI and a list of running spares are provided in appendix III.

6. Description

The LS-147(*)/FI (fig. 1, 2, and 3) is a self-contained unit. All operating controls are located on the front panel and all signal and power connections are located on the rear panel (fig. 7, 8, and 9). The external differences in models of the LS-147(*)/FI are listed in paragraph 7.

7. Differences in Models

All models of the LS-147(*)/FI are similar in size, shape, and general appearance. The external differences are listed in the chart below.

Item	LS-147A/FI	LS-147B/FI	LS-147C/FI	LS-147D/FI
Cabinet	Wood	Metal	Metal	Metal
Pilot lamp location	Behind front panel	Behind front panel	On front panel	On front panel
RECEIVE control	Not included	Not included	Included	Included
Power cord ground lead	Not included	Not included	Included	Included
Binding posts	Screw-type	Screw-type	Push-type (rubber-covered)	Screw-type

CHAPTER 2

INSTALLATION AND OPERATION

Section I. SERVICE UPON RECEIPT OF EQUIPMENT

8. Unpacking and Checking (fig. 4)

a. Packaging Data. Figure 4 illustrates a typical method of packaging and packing the LS-147(*)/FI. The wooden packing case is approximately 9 inches deep, 9 inches high, and 13 inches long. The volume of the packaged unit is approximately 0.61 cubic feet, and the weight is approximately 15 pounds.

b. Removing Contents.

(1) Cut the metal straps just below the wooden cover.

(2) Use a nailpuller and remove the nails from the wooden cover.

Caution: Do not attempt to pry off the wooden cover. Tools used for prying will damage the equipment.

(3) Remove the wooden cover and follow the procedures in *(a)* below if the equipment is packed for export shipment or *(b)* below if the equipment is packaged for domestic shipment.

(a) Open the outer corrugated carton and slit the water-vaporproof barrier.

(b) Slit the waterproof case liner.

(4) Open the inner corrugated carton and remove the contents.

c. Checking.

(1) Inspect the equipment for any loss or damage that may have occurred during shipment. If the equipment has been damaged or is incomplete, refer to paragraph 2.

(2) Check the equipment against the packing list. When no packing list accompanies the equipment, appendix III may be used as a general check to indicate the equipment that *probably* has been packed.

(3) Check the front-panel controls to be sure that they operate without binding.

(4) Check the power cord for cuts, breaks, or other damage.

(5) Check to be sure that the proper size (1 ampere) fuse has been installed.

(6) If the equipment has been used or reconditioned, check to see whether it has been changed by a modification work order (MWO). If modified, the MWO number will appear on the front panel, near the nomenclature plate.

9. Installation.

To install the LS-147(*)/FI in a shelter, follow the procedures given in *a* below. To install the LS-147(*)/FI in an office, follow the procedures in *b* below. If the LS-147(*)/FI is preinstalled in a shelter, check to see that the procedures in *a* below have been completed.

Note. The procedures described below should be performed by organizational maintenance personnel.

a. Shelter.

(1) Install the LS-147(*)/FI at the location where it is to be operated. If mounting brackets are provided, secure the unit in position with the mounting brackets.

(2) Connect the chassis to shelter ground. Connect the LS-147C/FI power cord ground lead (fig. 8) and the LS-147D/FI power cord ground lead (fig. 9) to a ground connection at or near the alternating current (ac) outlet. For connection of the LS-147A/FI and the LS-147B/FI chassis to ground, obtain a length of wire equipped with spade lugs on both ends. Connect and secure one spade lug between the hexagonal

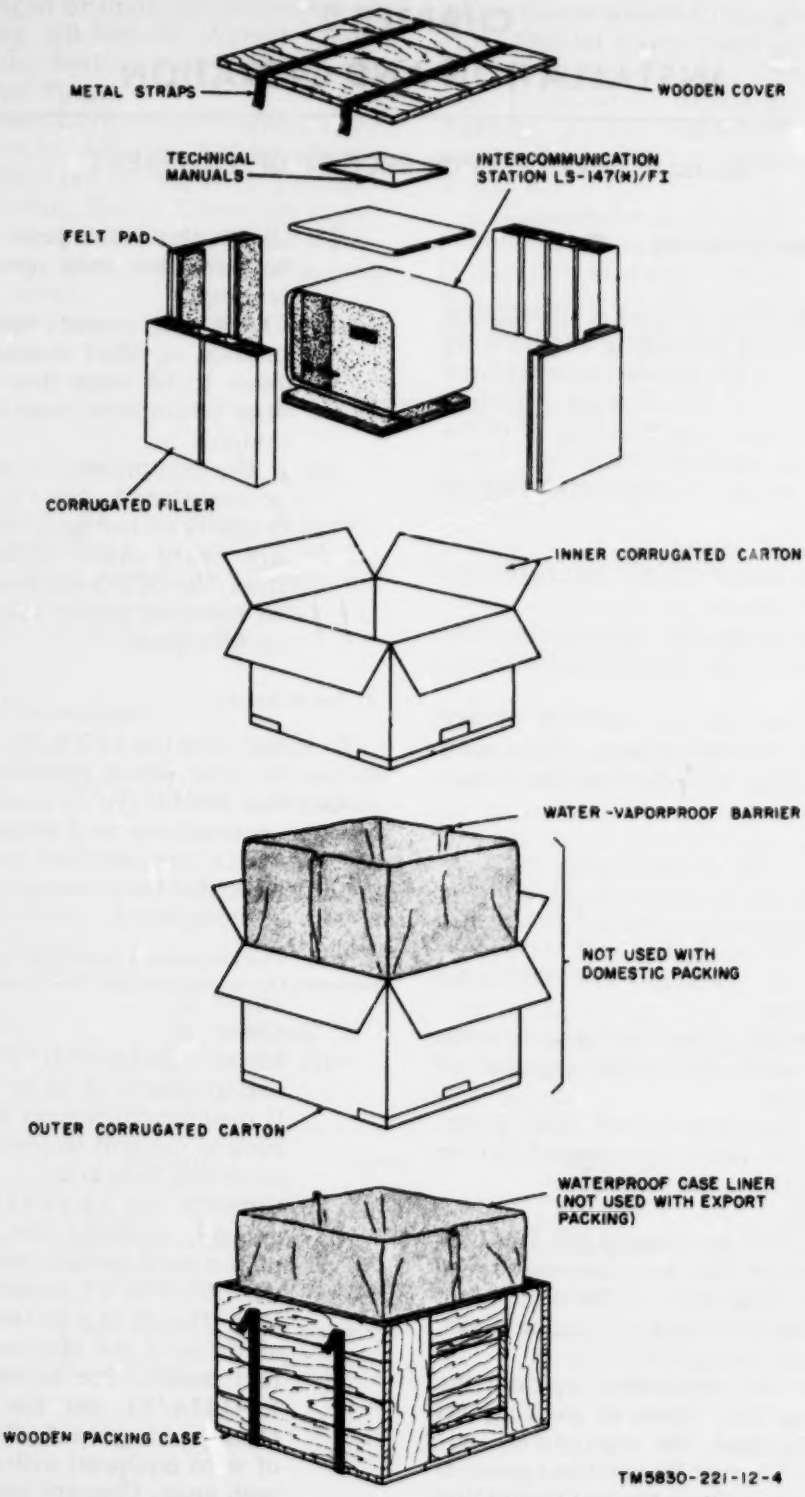

Figure 4. LS-147(*)FI, typical packaging and packing diagram.

nuts on the ground terminal at the rear panel of the unit (fig. 7); connect the other spade lug to a ground connection at or near the ac outlet.

(3) Connect a twisted pair of wires to the two binding posts on the rear panel of the unit. The twisted pair must be long enough to be connected to another LS-147(*)/FI at a distant location. Use shelter wiring, if provided, for the wire-pair connection at the binding posts. All stations in the loop must be connected in parallel.

(4) Connect the power cord plug to 115-volt, 60 cycles per second (cps) source.

b. Office.

(1) Position the unit on a desk, table, or other flat surface where it is to be operated.

Caution: **Place the unit so that it cannot be accidentially knocked off its location.**

(2) Connect the chassis to ground (*a* (2) above).

(3) Connect a twisted pair of wires to the two binding posts on the rear panel of the unit. The twisted pair must be long enough to be connected to another LS-147(*)/FI at a distant location. All stations in the loop must be connected in parallel.

(4) Connect the power cord plug to a 115-volt, 60-cps source.

Section II. OPERATION

10. Controls and Indicator

a. LS-147A/FI and LS-147B/FI (fig. 1).

Control or indicator	Function	
	Position	*Action*
VOLUME control:		
On-off switch	OFF (clockwise).	Disconnects power from the unit.
Potentiometer	HI-LO.	Controls volume to all other units in the system.
Press to talk switch (two-position nonlocking lever switch)	Talk (depressed position).	Permits the operator to talk to all other stations in the system.
	Listen (nondepressed position).	Permits the operator to hear all transmissions in the system.
Pilot lamp (incandescent-type)		When lighted, indicates that power is applied to unit.

b. LS-147C/FI and LS-147D/FI (fig. 2 and 3).

Control or indicator	Function	
	Position	*Action*
OFF-SEND control:		
On-off switch.....	OFF (clockwise on LS-147D/FI); (counterclockwise on LS-147C/FI).	Disconnects power from the unit.
Potentiometer.....	1-10 (to increase volume turn control clockwise).	Controls volume to all other units in the system.
RECEIVE control (potentiometer).	1-10 (to increase volume, turn control clockwise).	Controls receive volume from distant station.
PRESS TO TALK switch (Two-position nonlocking lever switch)	Talk (depressed position)	Permits the operator to talk to other stations in the system.
	Listen (nondepressed position)..	Permits the operator to hear all transmissions in the system.
Pilot lamp (neon-type).....		When lighted, indicates that power is applied to unit.

11. Operation Under Usual Conditions

a. Calling Distant Station.

(1) Turn the VOLUME control (LS-147A/FI and LS-147B/FI) counterclockwise, the OFF-SEND control (LS-147C/FI) clockwise, or the OFF-SEND control (LS-147D/FI) counterclockwise, until a click heard; then position the control approximately at its midposition. The pilot lamp, when lighted, indicates that the unit is turned on.

(2) Depress the PRESS TO TALK switch, and speak directly at the front panel. Speak in a normal tone voice.

(3) Release the PRESS TO TALK switch, and wait for the distant station to call.

b. Receiving Call from Distant Station.

(1) The VOLUME control (LS-147A/FI and LS-147B/FI) or the OFF-SEND control (LS-147C/FI and LS-147D/FI) need not be in the *on* position to receive a call, but must be in the *on* position to answer or call a distant station (*a* above).

(2) If the received call is not at the desired volume level, adjust the RECEIVE control (LS-147C/FI or LS-147D/FI) for the desired volume. If the received call is not at the desired volume level for the LS-147A/FI or LS-147B/FI, call the distant station (*a* above) and request that the transmit volume level be readjusted.

c. Stopping. To remove power from the LS-147(*)/FI, turn the VOLUME control (LS-147A/FI and LS-147B/FI) clockwise, the OFF-SEND control (LS-147C/FI) counterclockwise, or the OFF-SEND control (LS-147D/FI) clockwise, until a click is heard.

12. Operation Under Unusual Conditions

a. General. The operation of the LS-147(*)/FI may be difficult in regions where extreme cold, heat, humidity, or sand conditions prevail. Unless precautions were taken, adverse conditions may cause poor operation. The procedures described in *b* through *d* below will minimize the effects of these unusual climatic conditions.

b. Operation in Arctic Climates. Subzero temperatures and climatic conditions associated with cold weather affect the efficient operation of the LS-147(*)/FI. Follow the instructions and precautions below for operation under such adverse conditions.

(1) Keep the LS-147(*)/FI warm and dry.

(2) After the LS-147(*)/FI has been exposed to the cold and is brought into a warm room, moisture will collect on the unit; this may cause a change in operating characteristics. When the unit reaches room temperature, dry it thoroughly.

c. Operation in Tropical Climates. High relative humidity causes condensation to form on the LS-147(*)/FI whenever the temperature of the unit is lower than that of the surrounding air. To minimize this condition, provide as much ventilation as possible. Dry the unit thoroughly before operating it.

d. Operation in Desert Climates.

(1) The main problem that arises with equipment operation in desert areas is the large amount of sand, dust, or dirt that enters the LS-147(*)/FI chassis.

(2) Be careful to keep the unit as free from dust as possible. Make frequent preventive maintenance checks (para 14). This equipment does not require lubrication and should be kept free from oil and grease. Dust, sand, and dirt that come in contact with oil or grease results in grit, which will damage the unit.

CHAPTER 3
MAINTENANCE INSTRUCTIONS

Section I. OPERATOR'S MAINTENANCE

13. Scope of Operator's Maintenance

The following is a list of maintenance duties normally performed by the operator of the LS-147(*)/FI. These procedures do not require special tools or test equipment.

a. Preventive maintenance (para 14).

b. Visual inspection (para 15).

c. Troubleshooting, by use of the equipment performance checklist (para 16).

d. Replacing fuses (para 17).

14. Preventive Maintenance

a. DA Form 11-238. Items 1 through 12 on DA Form 11-238 (fig. 5 and 6) constitute a preventive maintenance checklist to be used by the operator. Items not applicable to the LS-147(*)/FI are lined out in figures 5 and 6. References in the ITEM block in the figures refer to paragraphs that contain additional maintenance information pertinent to the particular item. Instructions for use of the form appear on page 1 of the form.

b. Items. The information in the following chart is supplementary to DA Form 11-238. The item numbers correspond to the ITEM numbers on the form.

Item	Maintenance procedures
2	Remove dust, dirt, grease, and moisture from the outside of the cabinet with a clean, dry, lint-free cloth.
3	Operate the PRESS TO TALK switch and check to see that it returns to the listen (nondepressed) position.
	Check all controls to make sure that they operate smoothly.
10	Inspect the power cord plug for proper connection to the ac outlet.
	Check for proper ground connections on the chassis (par 9*a*(2)).
	Check the binding post connections for secure connections of signal line wires.

15. Visual Inspection

a. When the LS-147(*)/FI fails to perform properly, check all the conditions listed below. *Do not check any item with the power on.*

(1) Wrong setting of controls and switches (para 10).

(2) Bad chassis ground connections (para 9).

(3) Disconnected power cord plug at the ac outlet.

(4) Loose or disconnected binding post connections.

(5) Burned-out fuse (para 17).

b. If the above checks do not restore the LS-147(*)/FI to normal operation, refer the equipment to higher echelon for repair.

16. Equipment Performance Checklist

a. General. The equipment performance checklist is used to systematically check equipment performance. All corrective measures that the operator is authorized to perform are given in the *Corrective measures* column. If these measures do not correct the fault, additional maintenance must be performed by higher-echelon maintenance personnel having required tools, test equipment, and skill. In this case, note on the repair tag how the equipment performed and what corrective measures were taken.

b. Procedure. To use the equipment performance checklist, start with item No. 1 and perform each procedure in sequence, as follows:

c. Checklist.

	Item No.	Item	Action or condition	Normal indication	Corrective measures
PREPARATORY	1	Ground connection.....	Check to see that power cord ground lead is connected to ground (LS-147C/FI and LS-147D/FI) (para 9). Check to see that ground wire is connected between chassis and ground (LS-147A/FI and LS-147B/FI).		
	2	Line binding posts.....	Check to see that two line wires are connected to binding posts of each LS-147(*)/FI.		
	3	Power cord.....	Check to see that power cord plug is connected to a 115-volt 60-cps outlet.		
START	4	VOLUME control (LS-147A/FI and LS-147B/FI). OFF-SEND control (LS-147C/FI and LS-147D/FI).	Operate control until click is heard; then position control at approximately midposition.	Pilot lamp should light.	Replace fuse (para 17). Check power cord plug connection. Higher echelon maintenance required.
EQUIP. PERF.	5	PRESS TO TALK switch.	Depress switch to talk position and speak into front panel. (Request transmission from distant station.)	Transmission from local station should be heard at distant station.	Check line connections on binding posts. Higher echelon maintenance required.
	6	PRESS TO TALK switch.	Allow switch to return to listen (nondepressed) position.	Transmission from distant station should be heard at local station.	Higher echeoln maintenance required.
	7	RECEIVE control (LS-147C/FI and LS-147D/FI).	Position control for desired receive volume.	Desired volume of received signal is obtained.	Higher echelon maintenance required.
STOPPING	8	VOLUME control LS-147A/FI and LS-147B/FI or OFF-SEND control (LS-147C/FI and LS-147D/FI).	Operate control to OFF position.	Pilot lamp goes out.	

17. Replacing Fuses (fig. 7, 8 and 9)

a. Turn the fuse cap 1/4 turn counterclockwise and remove the fuse and fuse cap.

b. Remove the fuse from the fuse cap.

c. Insert a new fuse in the fuse cap.

d. Insert the fuse and fuse cap in the fuseholder and turn the fuse cap 1/4 turn clockwise to secure it.

Note. If the new fuse burns out, notify higher echelon maintenance personnel.

ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS	CONDITION
26. ~~INSPECT ANTENNA FOR CORROSION, CRACKED PIT, DAMAGED INSULATORS AND REFLECTORS~~	
27. CHECK FOR NORMAL OPERATION. PARA. 20b	
28. ~~BEFORE SHIPPING OR STORING REMOVE BATTERIES~~	

IF DEFICIENCIES NOTED ARE NOT CORRECTED DURING THE INSPECTION, INDICATE ACTION TAKEN FOR CORRECTION.

ITEM 7. RUBBER SHEATH ON THE CORD IS DEFECTIVE. REPORTED TO 3D ECHELON MAINTENANCE FOR REPAIR.

FOLD

MAINTENANCE CHECK LIST FOR SIGNAL EQUIPMENT
SOUND EQUIPMENT, RADIO, DIRECTION FINDING RADAR, CARRIER, RADIOSONDE AND TELEVISION
(AR 750-625)

EQUIPMENT NOMENCLATURE: INTERCOMMUNICATION STATION LS-147(X)/FT

EQUIPMENT SERIAL NUMBER:

INSTRUCTIONS

This form may be used for a period of one month by using the correct dates and weeks of the month. It is to be used as a Preventive Maintenance check list for Signal equipment in actual use, or for a check on equipment prior to issue.

1. For detailed Preventive Maintenance instructions see:
   a. The Technical Manual *(in TM 11 series)* for the equipment. *(See DA Pamphlet Number 310-4)*
   b. The Supply Bulletin *(SB 11-100 series)* for the equipment. *(See DA Pamphlet Number 310-4)*
   c. The Department of the Army Lubrication Order. *(See DA Pamphlet Number 310-4)*

2. The following action will be taken by either the Communications Officer/ Chief for 1st echelon, or the Inspector for higher echelon:
   a. Enter Equipment Nomenclature and Serial Number.
   b. Strike out items that do not apply to the equipment.

3. Operator/Inspector will enter in the columns entitled CONDITION, on the proper line, a notation regarding the condition, using symbols specified under LEGEND.

4. After operator completes each daily inspection he will initial over the appropriate dates under "Daily Condition for Month", then return form to his supervisor.

TYPE OF INSPECTION

OPERATOR	2/3 ECHELON	DATE	SIGNATURE
✓		11 Apr '61	B. K. Wigorn
	✓	18 APR '61	R. Brown

4

DA FORM 1 MAY 57 11-238

REPLACES DA FORMS 11-238, 1 NOV 48; 11-239, 11-244, 11-245, 11-248, 11-249, 11-250, AND 11-251, WHICH ARE OBSOLETE.

TM5830-221-12-5

Figure 5. DA Form 11-238, pages 1 and 4.

LEGEND for marking conditions:
Satisfactory, ✓.
Adjustment, Repair or Replacement required, X.
Defect corrected, (X).

DAILY CONDITION FOR MONTH OF APRIL 1961

NO.	DAILY ITEM	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	2D 3D ECHELON
		17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
1.	COMPLETENESS AND GENERAL CONDITION OF EQUIPMENT. ([illegible], wire, cables, microphones, tubes, spare parts, technical manuals).	✓	✓			✓	✓	✓	✓	✓								
2.	CLEAN DIRT AND MOISTURE FROM [illegible] MICROPHONES, [illegible] PLUGS, COMPONENT PANELS. PARA. 14b	✓	✓			✓	✓	✓	✓	✓								
3.	INSPECT CONTROLS FOR NORMAL OPERATION. TAP CONTROLS LIGHTLY FOR EVIDENCE OF CUT-OUT FROM LOOSE CONTACTS. PARA 14b	✓	✓			✓	✓	✓	✓	✓								
4.	CHECK FOR NORMAL OPERATION OF EQUIPMENT. BE ALERT FOR UNUSUAL OPERATION OR CONDITION.	✓	✓			✓	✓	✓	✓	✓								

	WEEKLY	CONDITION EACH WEEK 1ST	2D	3D	4TH	5TH	2D 3D ECH
5.	CLEAN AND TIGHTEN EXTERIORS OF CASES [illegible]	✓					
6.	INSPECT CASES, [illegible] AND EXPOSED METAL SURFACES FOR RUST, CORROSION.	✓					
7.	INSPECT CORDS, CABLE, WIRE, [illegible] FOR CUTS, KINKS, BREAKS, FRAYING, UNDUE STRAIN.	X					
8.	[illegible] FOR PROPER TENSION OR DAMAGE.						
9.	[illegible] FOR LOOSE, TORN, FRAYING.						
10.	INSPECT ACCESSIBLE ITEMS FOR LOOSENESS: SWITCHES, KNOBS, [illegible] CONNECTORS, [illegible] TRANSFORMERS, [illegible] PILOT LIGHTS, [illegible] ETC. PARA 14b	✓					
11.	CLEAN AND/OR INSPECT [illegible] BRASS NAME PLATES, [illegible]	✓					
12.	[illegible] FOR PROPER TENSION, LOOSE TERMINALS, EFFECTIVE GRADUCE, DAMAGED CASES. [illegible]						

	ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS	CONDITION
13.	[illegible]	
14.	[illegible]	

	ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS	CONDITION
15.	INSPECT SEATING OF READILY ACCESSIBLE PLUG-OUT ITEMS, TUBES, LAMPS, FUSES, [illegible] CONNECTORS, [illegible]. PARA 20b	
16.	[illegible] FOR LOOSE [illegible] MOUNTINGS, DUE CONTACTS AND ALIGNMENT OF CONTACTS AND SPRINGS, PROPER SPRING TENSION.	
17.	[illegible] FOR VARIABLE CAPACITORS FOR DIRT, MISALIGNMENT OF PLATES, LOOSE MOUNTINGS, MOISTURE.	
18.	INSPECT RESISTORS, [illegible] FOR CRACKS, [illegible], BLISTERING, MOISTURE, DISCOLORATION.	
19.	CLEAN AND TIGHTEN SWITCHES, TERMINAL BLOCKS, [illegible] AND INTERIORS OF CHASSIS AND CABINETS NOT READILY ACCESSIBLE. PARA 20b	
20.	INSPECT TERMINAL BLOCKS FOR LOOSE CONNECTIONS, CRACKS AND BREAKS.	
21.	[illegible] FOR DIRT, CORROSION, LOOSE CONTACTS.	
22.	INSPECT TRANSFORMERS, CHOKES, POTENTIOMETERS [illegible] FOR OVERHEATING AND OIL LEAKAGE.	
23.	[illegible] MOTORS FOR BRUSH WEAR, SPRING TENSION, UNDUE AND PITTING OF COMMUTATOR.	
24.	INSPECT CATHODE RAY TUBES FOR BURNT SCREEN SPOTS.	
25.	[illegible] FOR LOOSE, WORN OR LOOSE PARTS.	

CONTINUED ON PAGE 4

2 3

TM5830-221-12-6

Figure 6. DA For -238, pages 2 and 3.

Section II. ORGANIZATIONAL MAINTENANCE

18. Scope of Organizational Maintenance

The second echelon maintenance procedures on the LS-147(*)/FI consist of the following:

a. Preventive maintenance (para 20).
b. Visual inspection (para 21).
c. Troubleshooting (para 22).
d. Tube testing and replacement (para 23).
e. Removal and replacement of pilot lamp (para 24).

19. Tools and Test Equipment

The tools and test equipment required for organizational maintenance are listed below:

a. Tool Equipment TE-41.
b. Tool Equipment TE-113.
c. Test Set, Electron Tube TV-7/U.

20. Preventive Maintenance

a. Use of DA Form 11-238. Items 1 through 28 on DA Form 11-238 (fig. 5 and 6) constitute the preventive maintenance checklist to be used by organizational maintenance personnel. Items not applicable to the equipment are lined out in the figures. References in the ITEM block of figures 5 and 6 are to paragraphs that contain additional information pertinent to the particular item. Instructions for use of the form appear on page 1 of the form.

b. Items. The following information is supplementary to DA Form 11-238. The item numbers correspond to the ITEM numbers on the form.

***Warning:* Turn the VOLUME control (LS-147A/FI and LS-147B/FI) or the OFF-SEND control (LS-147C/FI and LS-147D/FI) to the OFF position, and disconnect the line cord plug from the ac outlet before performing items 15 and 19 of the following procedures.**

Item	Maintenance procedures
15	Check all tubes for proper seating in the tube sockets. Tube clamps are provided on the LS-147C/FI chassis for securing the tubes in the sockets (fig. 8).
19	Check the PRESS TO TALK switch for burned, dirty, or open contacts.
27	Perform the checks as indicated in the equipment performance checklist (para 16) to determine if the unit is operating properly.

21. Visual Inspection

Before operating the LS-147(*)/FI, inspect it. This will save repair time and may avoid further damage to the unit. In addition to the checks listed in paragraph 16, inspect the following for obvious defects before proceeding to the troubleshooting checklist (para 22).

a. Pilot lamp.
b. Seating of tubes.

22. Troubleshooting Checklist

The chart in *b* below is provided to help localize troubles in the LS-147(*)/FI to a defective tube, or pilot lamp. Only those corrective measures that the organizational maintenance man can perform are given. If the the measure indicated does not restore normal equipment performance, troubleshooting is required at a field maintenance level. Note on the repair tag what corrective measures were taken.

a. General. Before using the troubleshooting checklist, examine the repair tag to determine whether the trouble has been sectionalized. If there has been no sectionalization, perform the procedures outlined in the equipment performance checklist (para 16).

b. Troubleshooting Chart. When performing the checks indicated in the chart below, refer to figures 7, 8, and 9.

Symptom	Probable trouble	Correction
Pilot lamp does not light when VOLUME control (LS-147A/FI and LS-147B/FI) and OFF-SEND control (LS-147C/FI and LS-147D/FI) are turned on.	Defective pilot lamp.	Check pilot lamp. For replacement procedures, refer to paragraph 24.

Symptom	Probable trouble	Correction
No transmission to distant station. Reception is normal. Pilot lamp lights.	Defective tube V1, V2, or V3.	Check tubes V1, V2, or V3 to see if filaments glow or tube is cold. For testing and replacement procedures, refer to paragraph 23. If this does not clear trouble, trouble-shooting is required at field maintenance level.
Excessive hum transmitted to distant station.	Defective tube V1, V2, or V3.	Same as above.

23. Tube Testing and Replacement (fig. 7, 8, and 9)

If tube failure is suspected, use the applicable procedure below to check the tubes:

Caution: **Never rock or rotate a tube when removing it from a socket; carefully pull it straight out. Before replacing the tube in the socket, make certain that the tube pins are properly aligned with the tube socket.**

a. Using Tube Tester. Remove and test one tube at a time. Discard a tube only if its defect is obvious, such as an open filament or a broken envelope, or if the tube tester shows the tube to be defective. Do not discard a tube that tests at or slightly below its minimum test limit; such a tube may provide satisfactory performance for a long operational period. Put back the original tube or install a new one before testing the next one.

b. Tube Substitution. Replace a suspected tube with a new tube. If the LS-147(*)/FI remains inoperative, remove the new tube and replace the original tube. Repeat this procedure with each suspected tube until the defective tube is discovered.

Note. Use the tube tester rather than the tube substitution method whenever possible.

24. Removal and Replacement of Pilot Lamp

To remove and replace the pilot lamp in the LS-147A/FI and LS-147B/FI, use the procedures in *a* below. To remove and replace the pilot lamp in the LS-147C/FI and LS-147D/FI, use the procedures in *b* below.

a. LS-147A/FI and LS-147B/FI (fig. 7).

(1) Remove the rear panel from the cabinet by removing the retaining screws and washers.

(2) Remove the knobs from the controls on the front panel by loosening the knob-retaining screws. On some models, Allen-head screws are used as knob-retaining screws.

(3) Remove the chassis-retaining screws and remove the rubber feet from the bottom of the cabinet.

(4) Remove the chassis from the cabinet.

(5) Press in the pilot lamp, twist it 1/4 turn counterclockwise, and remove it from the holder.

(6) Obtain a new type No. 44 pilot lamp and install it by aligning the pins on the lamp base with the slots in the lamp socket. Push the lamp into the socket and turn 1/4 turn clockwise.

(7) Replace the chassis in the cabinet and replace the rubber feet and the chassis-retaining screws.

Caution: **Do not overtighten the chassis-retaining screws, because this will damage the rubber feet.**

(8) Replace the rear cover plate with the vent slots pointing outward and downward. The rear cover plate of the LS-147A/FI, LS-147B/FI, and LS-147D/FI are provided with guides which fit into the top of the inside of the cabinet.

(9) Replace the front panel control knobs on the shafts and tighten the knob-retaining screws. Do not push the knobs flush to the front panel when tightening the retaining screws, because this will cause the knob to rub on the front panel.

b. LS-147C/FI and LS-147D/FI (fig. 2 and 3).

(1) Unscrew the pilot lamp counter-

clockwise, and remove it from its holder on the front panel.

(2) Obtain a new type NE-45 pilot lamp and install it in the lamp socket.

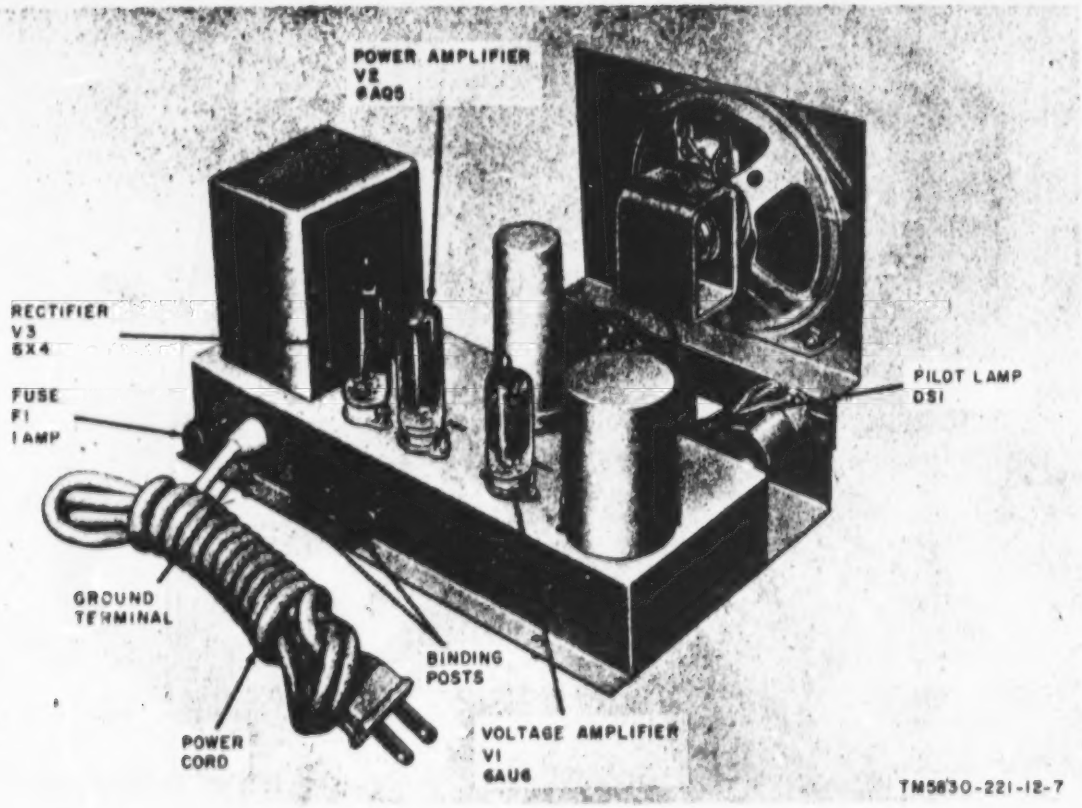

Figure 7. LS-147A/F1 or LS-147B/F1, removed from cabinet, showing location of tubes, fuse, pilot lamp, and binding posts.

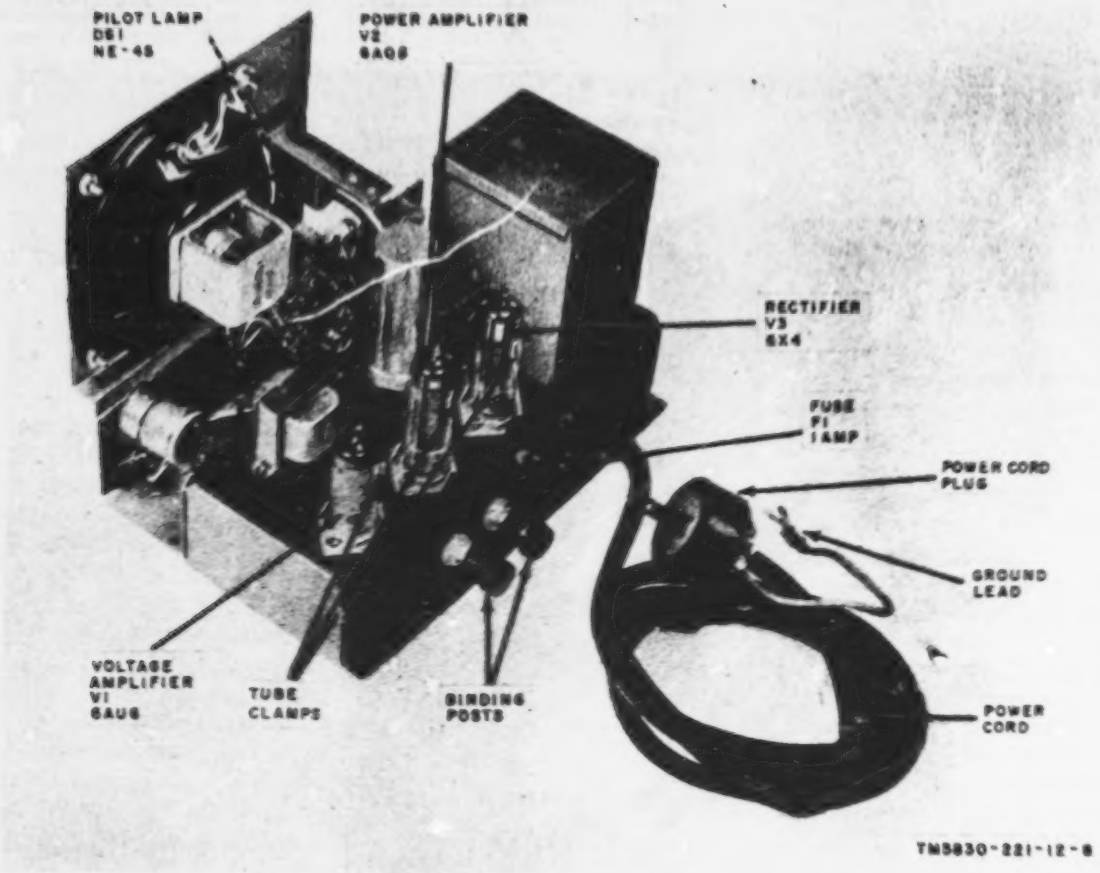

Figure 8. LS-147C/F1, removed from cabinet, showing location of tubes, fuse, pilot lamp, and binding posts.

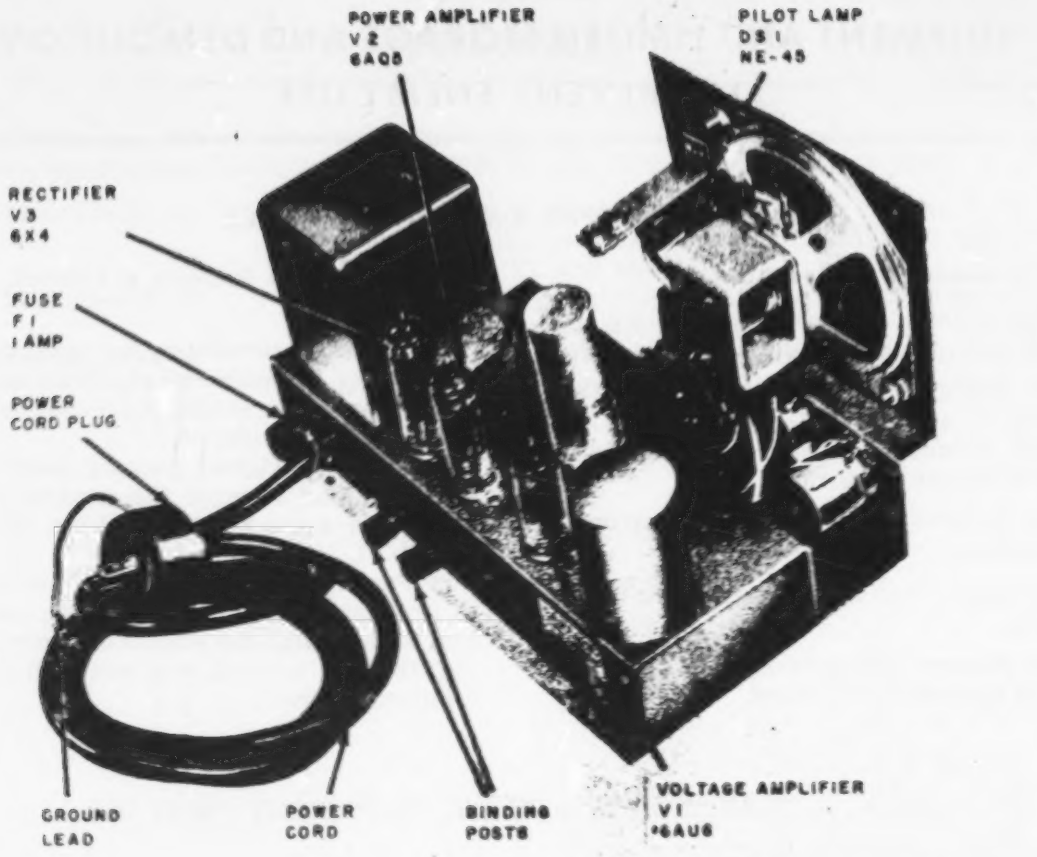

Figure 9. LS–147D/FI, removed from cabinet, showing location of tubes, fuse, pilot lamp, and binding posts.

CHAPTER 4
SHIPMENT AND LIMITED STORAGE AND DEMOLITION TO PREVENT ENEMY USE

Section I. SHIPMENT AND LIMITED STORAGE

25. Disassembly of Equipment

Disassembly procedures for the LS-147(*)/FI consist of the following steps:

a. Operate the VOLUME control (LS-147A/FI and LS-147B/FI) or the OFF-SEND control (LS-147C/FI and LS-147D/FI) to the OFF position.

b. Remove the power cord plug from the ac outlet.

c. Disconnect the wires from the binding posts.

d. Remove the ground lead connection from the external ground.

26. Repacking for Shipment or Limited Storage

a. The exact procedure for repackaging depends on the material available and the conditions under which the LS-147(*)/FI is to be shipped or stored.

b. Use the original packing material if available and reverse the unpacking instructions (para 8) to repackage the LS-147(*)/FI.

c. Package the LS-147(*)/FI securely to prevent damage during transit; pad the unit to minimize the effects of severe jolting. Be sure the unit is protected from inclement weather.

Section II. DEMOLITION OF MATERIEL TO PREVENT ENEMY USE

27. Authority for Demolition

Demolition of the equipment will be accomplished only upon the order of the commander. The destruction procedures outlined in paragraph 28 will be used to prevent further use of the equipment.

28. Methods of Destruction

Use any of the following methods to destroy the LS-147(*)/FI:

a. Smash. Smash the controls, tubes, transformers, capacitors, and resistors; use sledges, axes, handaxes, pickaxes, hammers, or crowbars.

b. Cut. Cut the power cord; use axes, handaxes, or machetes.

c. Burn. Burn the power cord and technical manuals; use gasoline, kerosene, oil, flamethrowers, or incendiary grenades.

d. Bend. Bend the chassis and case.

Warning: **Be extremely careful with explosives and incendiary devices. Use these items only when the need is urgent.**

e. Explode. If explosives are necessary, use firearms, grenades, or TNT.

f. Dispose. Bury or scatter the destroyed parts in slit trenches or foxholes, or throw them into streams.

APPENDIX I

REFERENCES

Following is a list of references applicable and available to the operator of Intercommunication Stations LS-147A/FI, LS-147B/FI, LS-147C/FI, and LS-147D/FI.

TM 11-5830-221-20P	Organizational Maintenance Repair Parts and Special Tools List, Intercommunication Stations LS-147A/FI, LS-147B/FI, LS-147C/FI, and LS-147D/FI.
TM 11-6625-203-12	Operation and Organizational Maintenance: Multimeter AN/URM-105, Including Multimeter ME-77/U.
TM 11-6625-274-12	Operator's and Organizational Maintenance Manual: Test Sets, Electron Tube TV-7/U, TV-7A/U, TV-7B/U, and TV-7D/U.

APPENDIX II
MAINTENANCE ALLOCATION

Section I. INTRODUCTION

1. General

a. This appendix assigns maintenance functions and repair operations to be performed by the lowest appropriate maintenance echelon.

b. Columns in the maintenance allocations chart are as follows:

(1) *Part or component.* This column shows only the nomenclature or standard item name. Additional descriptive data are included only where clarification is necessary to identify the part. Components and parts and subassemblies are in alphabetical sequence with their components listed alphabetically immediately below the assembly listing.

(2) *Maintenance function.* This column indicates the various maintenance functions allocated to the echelon capable of performing the operation. These are as follows:

(a) Service. To clean, to preserve, and to replenish fuel and lubricants.

(b) Inspect. To verify serviceability and to detect incipient electrical or mechanical failure by scrutiny.

(c) Test. To verify serviceability and to detect incipient electrical or mechanical failure by use of special equipment such as gages, meters, etc.

(d) Replace. To substitute serviceable assemblies, subassemblies, and parts for unserviceable components.

(e) Repair. To restore to a serviceable condition by replacing unserviceable parts or by any other action required utilizing tools, equipment, and skills available, to include welding, grinding, riveting, straightening, adjusting, etc.

(f) Rebuild. To restore to a condition comparable to new by disassembling the item to determine the condition of its component parts and reassembling it using serviceable, rebuilt, or new assemblies, subassemblies, and parts.

(3) *1st, 2d, 3d, 4th, and 5th echelon.* The symbol X indicates the echelon responsible for performing that particular maintenance operation, but does not necessarily indicate that repair parts will be stocked at that level. Echelons higher than the echelon marked by X are authorized to perform the indicated operation.

(4) *Tools required.* This column indicates codes assigned to each individual tool equipment, test equipment, and maintenance equipment referenced. The grouping of codes in this column indicates the tool, test, and maintenance equipment required to perform the maintenance function.

c. Columns in the allocation of tools for maintenance functions are as follows:

(1) *Tools required for maintenance functions.* This column lists tools, test, and maintenance equipment required to perform the maintenance functions.

(2) *1st, 2d, 3d, 4th, and 5th echelon.* A dagger (†) symbol indicates the echelon allotted to the facility.

(3) *Tool code.* This column lists the tool code assigned.

2. Maintenance by Using Organizations

When this equipment is used by signal service organizations organic to theater headquarters or communication zones to provide theater communications, those maintenance fuctions allocated up to and including fourth echelon are authorized to the organization operating this equipment.

3. Mounting Hardware

The basic entries of this maintenance allocation chart do not include mounting hardware such as: screws, nuts, bolts, washers, brackets, clamps, etc.

Section II. MAINTENANCE ALLOCATION CHART

(1) PART OR COMPONENT	(2) MAINTENANCE FUNCTION	(3) 1ST ECH	(4) 2ND ECH	(5) 3RD ECH	(6) 4TH ECH	(7) 5TH ECH	(8) TOOLS REQUIRED	(9) REMARKS
INTERCOMMUNICATION STATION LS-147A/FI; LS-147B/FI; LS-147C/FI; LS-147D/FI	service	X						
	inspect		X					
	test		X				5	Tubes and plug out items
				X			3, 5, 7	
					X		1 thru 5, 7	Final test
	repair		X				6, 8	
	rebuild					X	6	

Section III. ALLOCATION OF TOOLS FOR MAINTENANCE FUNCTIONS

(1) TOOLS REQUIRED FOR MAINTENANCE FUNCTIONS	(2) 1ST ECH	(3) 2ND ECH	(4) 3RD ECH	(5) 4TH ECH	(6) 5TH ECH	(7) TOOL CODE	(8) REMARKS
LS-147A/FI; LS-147B/FI; LS-147C/FI; LS-147D/FI (continued)							
ANALYZER, SPECTRUM TS-723/U				†		1	
AUDIO OSCILLATOR TS-382A/U				†		2	
MULTIMETER AN/URM-105			†	†		3	
TEST SET, ELECTRON TUBE: TV-2/U				†		4	
TEST SET, ELECTRON TUBE TV-7/U		†	†	†		5	
TOOL EQUIPMENT TE-113		†			†	6	
VOLTMETER METER ME-30A/U			†	†		7	
TOOL EQUIPMENT TE-41		†				8	

APPENDIX III
BASIC ISSUE ITEMS LIST

Section I. INTRODUCTION

1. General

This appendix lists items supplied for initial operation and for running spares. The list includes tools, accessories, parts, and material issued as *part of* the major end item. The list includes all items authorized for basic operator maintenance of the equipment. End items of equipment are issued on the basis of allowances prescribed in equipment authorization tables and other documents that are a basis for requisitioning.

2. Columns

a. Source, Maintenance, and Recoverability Code. Not used.

b. Federal Stock Number. This column lists the 11-digit Federal stock number.

c. Designation by Model. The dagger (†) indicates the model in which the part is used.

d. Description. Nomenclature or the standard item name and brief identifying data for each item are listed in this column. When requisitioning, enter the nomenclature and description.

e. Unit of Issue. The unit of issue is the supply term by which the individual item is counted for procurment, storage, requisitioning, allowances, and issue purposes.

f. Expendability. Expendable items are indicated by the letter X; nonexpendable items are indicated by NX.

g. Quantity Authorized. Under "Items Comprising an Operable Equipment", the column lists the quantity of items supplied for the initial operation of the equipment. Under "Running Spares and Accessory Items", the quantities listed are those issued initially with the equipment as spare parts. The quantities are authorized to be kept on hand by the operator for maintenance of the equipment.

h. Illustrations. Not used.

Section II. FUNCTIONAL PARTS LIST

(1) SOURCE MAINTENANCE AND RECOVERABILITY CODE	(2) FEDERAL STOCK NUMBER	(3) DESIGNATION BY MODEL	(4) DESCRIPTION	(5) UNIT OF ISSUE	(6) EXPENDABILITY	(7) QUANTITY AUTHORIZED	(8) ILLUSTRATIONS FIGURE NO	(9) ILLUSTRATIONS ITEM NO
	5830-222-1661 5830-681-9616 5830-752-5357 5830-752-5355	1 2 3 4	INTERCOMMUNICATION STATION LS-147A/FI INTERCOMMUNICATION STATION LS-147B/FI INTERCOMMUNICATION STATION LS-147C/FI INTERCOMMUNICATION STATION LS-147C/FI					
			ITEMS COMPRISING AN OPERABLE EQUIPMENT					
			NOTE: Model Column 1 refers to LS-147A/FI; Column 2 refers to LS-147B/FI Column 3 refers to LS-147C/FI; Column 4 refers to LS-147D/FI					
			INTERCOMMUNICATION STATION LS-147A/FI: two-way comm over single wire pair which interconnects all other stations in network; non-selective; amplifier incl; wood cabinet; Continental Electronic Model No. 8-47A	ea	NX			
			INTERCOMMUNICATION STATION LS-147B/FI: two-way comm over single wire pair which interconnects all other stations in network, non-selective; amplifier incl; steel cabinet; Continental Electronics Model No. 8-47B	ea	NX			
			INTERCOMMUNICATION STATION LS-147C/FI: two-way comm over single wire pair which interconnects all other stations in network; non-selective; amplifier incl; gain control; for xmitting; level control for receiving; steel cabinet; St-Carl dwg No. 809000-100	ea	NX			
			INTERCOMMUNICATION STATION LS-147D/FI: two-way comm over single wire pair which interconnects all other stations in network; non-selective; amplifier incl; level control for receiving; steel cabinet; St Carl dwg No. 666176-477	ea	NX			
			INTERCOMMUNICATION STATION LS-147A/FI (Basic component)	ea	NX	1		
			INTERCOMMUNICATION STATION LS-147B/FI (Basic component)	ea	NX	1		

(1) SOURCE MAINTENANCE AND RECOVERABILITY CODE	(2) FEDERAL STOCK NUMBER	(3) DESIGNATION BY MODEL	(4) DESCRIPTION	(5) UNIT OF ISSUE	(6) EXPENDABILITY	(7) QUANTITY AUTHORIZED	(8) ILLUSTRATIONS FIGURE NO	(9) ILLUSTRATIONS ITEM NO
		1 2 3 4	LS-147A/FI; LS-147B/FI; LS-147C/FI; LS-147D/FI (continued)					
			INTERCOMMUNICATION STATION LS-147C/FI (Basic component)	ea	NX	1		
			INTERCOMMUNICATION STATION LS-147D/FI (Basic component)	ea	NX	1		
	Drd thru AGC	† † † †	TECHNICAL MANUAL TM 11-5830-281-12	ea	NX	2		
			RUNNING SPARES AND ACCESSORY ITEMS					
			INTERCOMMUNICATION STATION LS-147A/FI; LS-147B,C,D/FI					
	5920-284-9220	† † †	FUSE, CARTRIDGE: 1 amp, 250v; time delay; MIL type MS9007B-24	ea	X	5		
	5920-280-4465	†	FUSE, CARTRIDGE: 1 amp; 250v;, MIL type F02G1R00A	ea	X	5		

By Order of the Secretary of the Army:

G. H. DECKER,
General, United States Army,
Chief of Staff.

Official:

R. V. LEE,
Major General, United States Army,
The Adjutant General.

Distribution:

Active Army:

To be distributed in accordance with DA Form 12–7 requirments for TM 11 Series (Unclas) plus the following:

DASA (5)	11–97 (2)
USASA (2)	11–98 (2)
CNGB (1)	11–117 (2)
Tech Stf, DA (1)	11–155 (2)
except CSigO (18)	11–500 (AA–AE) (RM–RT) (4)
ARADCOM (2)	11–555 (2)
ARADCOM Rgn (2)	11–557 (2)
MDW (1)	11–587 (2)
Seventh US Army (2)	11–592 (2)
EUSA (2)	11–597 (2)
Units org under fol TOE:	44–435 (2)
9–47 (2)	44–436 (2)
9–87 (2)	44–437 (2)
9–227 (2)	44–446 (2)
9–377 (2)	44–535 (2)
9–500 (AA–AC) (2)	44–536 (2)
11–5 (2)	44–537 (2)
11–7 (2)	44–544 (2)
11–16 (2)	44–546 (2)
11–57 (2)	44–548 (2)
11–96 (2)	

NG: State AG (3); Units—Same as Active Army except allowance is one copy to each unit.
USAR: None.
For explanation of abbreviations used, see AR 320–50.

* U.S. GOVERNMENT PRINTING OFFICE : 1989 O - 242-451 (1745)